

Environmental health

The gains in health and life expectancy that have been experienced since the turn of the century largely reflect environmental health interventions. Even today, exposure to environmental hazards can be a major contributing cause of disease, injury, and death. Routes of exposure can be as clear as contamination of drinking water and food, or as baffling and obscure as exposures to indoor air contaminants or insect/rodent borne hazards such as Lyme Disease and Hantavirus. Other environmental health threats include workplace hazards and exposures to pesticides and other chemicals.

Until the 1960s and 1970s, environmental health activities were an integral part of public health services. During this period, major changes occurred which combined such issues as energy conservation and natural resource protection with traditional environmental health activities.

The changes were symbolized at the federal level by the creation of the United States Environmental Protection Agency (EPA) to administer programs concerned with air and water, solid waste, and pesticides, and setting standards for ionizing radiation. The responsibility for identification, education, and modification of important environmental factors that increase the risk of illness and premature death was separated from other interrelated public health functions. As a result, many observers believe the health implications of environmental hazards have not received the depth of analysis or the level of support they deserve. In some cases, uninformed analysis of environmental health risks may have exacerbated fears of those risks unnecessarily.

Washington State has responded to many of the national initiatives. Recognition of the unique role of public health resulted in the creation of the Department of Health in 1989. This helped refocus the state on public health issues, and has firmly re-established environmental health as one of the essential components of public health protection.

This report describes and develops standards for a few key environmental problem areas which were identified by public health professionals in the state in 1993:

- *Drinking Water*
- *Hazardous substances*
- *Occupational hazard exposure*
- *Food protection*
- *Shellfish growing areas*
- *Recreational water*

It should be noted that the work presented here is limited, and does not include standards for many other significant environmental health issues such as radiation, vector-borne diseases, housing related issues, and point and non-point pollution source control.

*In preventing illness, injury, and death from environmental hazards, public health's first task is to identify causes. Programs or activities can then be developed to alleviate the causes. Since the science is still evolving, we do not always understand synergistic effects, combined pathways, persistence of harmful agents in the environment, and acute and long-term exposures to hazardous substances that affect our health. This impedes our ability to assess the risk associated with many contaminants. Also, as our understanding increases, environmental problems which we have not yet identified will need to be added to the standards. This is clearly indicated by the progressive identification of pathogens and chemical hazards which new laboratory methods now detect: *Giardia**

lamblia (1976), *Legionnaires' disease* (1977), *Campylobacter jejuni* (1980), *aldicarb* (1985), *E. coli* 0157:H7 (1985), *Lyme Disease* (1986), *domoic acid* (1991), *Cryptosporidium* (1992), *Phosdrin* (1992), and *Hantavirus* (1993).

The lack of appropriate baseline data is a major concern as environmental health standards are developed. This is due to several factors, including the lack of existing monitoring programs, and, where data does exist, data programs that are not compatible. A major thrust for environmental health over the next several years will be the development, integration and coordination of data between programs and agencies, and the development of adequate environmental monitoring systems to measure the progress of intervention strategies. This will allow both health and resource protection agencies to accurately assess problems and anticipate future needs. The program areas, health status indicators, and environmental exposure indicators developed in Washington State in the Environmental Health Addendum to APEX/PH will provide some direction for data development.

Development of the data necessary to evaluate the impacts from environmental threats requires careful coordination of laboratory test data. Every effort must be made to assure that data are readily accessible and of the highest possible quality. The state laboratory system provides reference capability, technical support, quality assurance oversight, laboratory certification services, and training for the private laboratories that provide routine testing. The state laboratories, working with local public health jurisdictions, also provide capacity to support investigations and to respond in the event of emergency.

In many cases the scope of the standards required to protect the public exceeds the authority of any one agency. Often the intervention strategies proposed will require federal, state, and local agencies, and Indian tribes, to work closely together to assure the public's health and safety. This is particularly true for the water quality, air quality, and toxic waste problems, which are principally directed by federal legislative mandates. Solutions to many problems will also require the cooperation of private enterprise and a commitment by the public.

Drinkingwater

Safe, reliable, and affordable drinking water is one of the most basic human requirements. In Washington State, people may receive their drinking water from public systems serving thousands of people, or from individual systems with less than two connections. Depending on the size of the system, the challenge of protecting the public's health varies significantly.

Publicwatersystems

Washington ranks third highest among the 50 states in the number of water systems violating the federal Safe Drinking Water Act (SDWA) and seventh highest in the percentage of population (36%) served by water systems not in compliance. During 1991 and 1992, the state is reported to have had the highest number of violations of drinking water standards in the nation and the fifth highest number of monitoring and reporting violations.

The U.S. Environmental Protection Agency (EPA) considers any water system that is not monitored or is in violation of maximum contaminant level (MCL) to be in violation and unsafe. The 1986 Amendments to the SDWA require the EPA to establish 83 new drinking water standards by 1990 and 25 new ones every three years thereafter. The implementation of these federal requirements has created a tremendous burden on state and local resources.

The economic impact of the new SDWA standards on affected water systems is substantial. Public water systems will need to spend over 2.2 billion dollars in infrastructure improvements, of which \$917 million currently has no identified source of funding. In addition, the quality of groundwater being used by small systems is largely unknown relative to the new drinking water standards for synthetic organic chemicals. SDWA monitoring for these contaminants is complex and costly, and will impose a significant burden on these systems as well as on the state's regulatory program. There is a need to focus on federal reauthorization of the SDWA, strengthening it to provide greater emphasis on risk-based standards, greater flexibility in state implementation of standards, and federal assistance to water systems for implementing requirements.

Washington is also facing challenges because of its large number of small systems. There are 14,435 public water systems in the state. Only about 200 of these have more than 1,000 service connections, but they serve 85% of the state's population. Ninety-five percent have less than 100 connections. Seventy percent have less than 15 connections, and the number of such small systems is increasing rapidly. These 10,000 very small systems serve only about 2% of the population, but require disproportionate amounts of regulatory attention.

Consumers being served by small water systems may be at greater risk of waterborne illness than those served by large systems because the design criteria are lower and there are fewer testing requirements. There is inadequate operation and maintenance due to lack of water system training. Systems with fewer than 100 service connections are not required to have certified operators unless they use surface water. Small systems are often owned and operated by homeowner associations, with no one person having clear responsibility for the system. Regulatory oversight and the assurance of reliable public health protection become increasingly difficult as the number of small water systems increases.

Factors leading to problems with public drinking water systems include:

- Inadequate state, local and tribal resources.*
- Requirements of the federal SDWA that are underfunded, inflexible, and are creating a significant economic burden on small communities.*
- Lack of financial assistance programs for small water systems.*
- Inadequate understanding by the public health community, state decision makers, water system owners and operators, and the public at large of the risks associated with the new drinking water standards.*
- The reluctance of the larger utilities to provide management service to small systems, and the reluctance of small system owners and customers to become part of larger systems.*

Intervention strategies to deal with public water system problems include:

- Direct state efforts to amend the federal Safe Drinking Water Act (SDWA) allowing greater state flexibility, easing the burden on small communities, and providing more resources for implementation.*
- Develop a comprehensive state revolving fund program for public water systems to assure compliance with SDWA requirements.*
- Enact legislation to prevent the formation of non-viable systems.*
- Adopt legislation requiring that all Group A public water systems have certified operators.*

- *Implement a routine sanitary survey program to monitor drinking water systems.*
- *Use Water System Operating Permits to monitor compliance with public health requirements.*
- *Require all new and expanding public water systems to meet state design and construction standards.*
- *Develop and maintain a statewide program to help small communities determine vulnerability of their supplies and reduce their monitoring requirements.*
- *Establish satellite management agencies in each county to assume operation of existing non-viable systems and service new system needs.*
- *Respond to consumer complaints and correct all verified public health problems.*
- *Develop and implement an effective water quality monitoring and data assessment program designed to measure the effectiveness of intervention strategies and identify emerging public health problems.*
- *Establish and maintain a database to track compliance with state rules enhancing program management and SDWA compliance.*
- *Ensure that all databases can be/are integrated into the overall Department of Health health information system.*
- *Develop and implement a program to effectively educate health department staff and the public on health risks of unsafe drinking water.*
- *Develop and maintain a comprehensive education and training program on health concerns related to drinking water.*
- *Develop and maintain a statewide database for Group B public water systems (between 2 and 10 connections).*
- *Encourage active public health participation in the development of the state's water resource policies and watershed management plans.*
- *Adopt regulations that require a source of supply analysis, and comprehensive conservation plans, including minimum water system reliability standards that include emergency plans and thresholds for additional water resources.*

Public waters systems (PWS) standards

(Outcome standards are for the year 2000 unless otherwise noted.)

Variable	Baseline	Outcome Standard
Waterborne Disease Outbreaks	13 outbreaks (Total, 1982-1991)	No more than 1 outbreak per year of pathogenic and/or chemical waterborne disease
Water System Operating Permits	78% compliance with Group A PWS operating permit requirements (1993)	95% compliance with Group A PWS comply with operating permit requirements.
Water System Monitoring	80% compliance with Group A PWS primary monitoring requirements (1993)	95% compliance with Group a PWS primary monitoring requirements.
Maximum Contaminant Level (MCL) Compliance	83% MCL compliance with Group A PWS MCL requirements (1993)	95% compliance with Group A PWS MCL requirements.
Operator Certification	15% of all Group A PWS have certified operators (100% compliance with current WAC-1993)	All Group A PWS have certified operators.
Regional Water Supply Plans for Critical Water Supply Areas (CWSSAs)	21 (100%) of CWSSAs have initiated and/or completed initial CWSSP.	By 2010, CWSS state's 21 CWSSAs remain current
Water Systems Plans (WSP)	5% of Group A community PWS have approved WSP.	95% of Group A community PWSs have approves WSPs.
Technical Assistance (Sanitary Survey)	186 community Group A PWSs surveyed annually (5 year annualized data, 1993); 5% of non-community PWSs surveyed within last 5 years.	All community Group A PWSs surveyed annually, and non-community PWSs surveyed every 3 years.
Satellite Management Agency (SMA)	30% of counties with SMA	All Counties have at least 1 SMA.

Individual drinking water systems

Individual water systems serve approximately 13% of the state's population. These systems may provide a lower level of public health protection to their users, and are proliferating in areas which are already, or could be, served by existing larger systems. Individual water systems primarily use ground water as their source of supply.

The state has requirements for well siting and construction, but lacks resources to ensure compliance. There is no effective program to provide well owners with water quality monitoring and technical assistance when problems occur.

There are inadequate resources for the Department of Health, Department of Ecology, local public health jurisdictions, and tribes to ensure compliance with well siting, construction, and abandonment requirements. Technical information, educational programs, and water quality maintenance requirements are inadequate. In addition, the costs to individual homeowners to connect to existing public water systems may exceed the cost of constructing a new well. This discourages many homeowners from making the better public health protection choice.

Intervention strategies regarding individual water systems include:

- *Adopt state legislation requiring counties to adopt ordinances limiting new individual water supplies to areas which cannot be served by an existing Group A system.*
- *Provide technical assistance to persons using individual wells in water quality monitoring, well abandonment, and source protection.*
- *Ensure that all data bases can be/are integrated into the overall Department of Health health information system.*
- *Provide education on the benefits of shared water facilities versus individual systems.*
- *Ensure that all domestic water supply wells comply with state siting and construction standards.*

Individual water systems: Water quality standards

(Outcome standards are for the year 2000 unless otherwise noted.)

Variable	Baseline	Outcome Standards
Source Adequacy	50% of local governments have implemented RCW 19.27.097 adequacy requirements (1992)	All local governments have implemented the adequacy requirements of RCW 19.27.097.
Proliferation of New Water Supplies	No counties have enacted ordinances limiting new individual water systems to areas that cannot be adequately served an existing Group A water system. (1993)	All counties have ordinances limiting new individual water systems to areas that cannot be served by an existing Group A public water system.

Source protection

Washington's waters are a limited resource for which there is growing demand. From a public health perspective, individual and public drinking water supplies, as well as recreational uses and shellfish production, are of particular importance. Maintaining and protecting the purity and high quality of water sources are critical aspects of providing safe and adequate drinking water.

Currently, over 75% of the state's population derives its drinking water from surface sources. Over 90% of water systems use groundwater as their sole source of supply, and in some basins there is a limit, if not a shortage, of new sources of supply.

Prevention of water contamination is of critical importance. On-site wastewater treatment and disposal is a particular problem because of the large number of new on-site systems being created (25,000 per year), and because many systems still in use were built before regulations emphasized the treatment of sewage.

Drought conditions and other short-term emergency water shortage situations require immediate action to ensure adequate quantity and quality of water. Growth Management Act (GMA) planning impacts available water resources, but should ensure that adequate and reliable sources of drinking water are available. However, without coordination between Coordinated Water System Plans, utility comprehensive plans, GMA plans and water resources management plans, the ability to ensure adequate and reliable drinking water is jeopardized.

Intervention strategies related to groundwater include:

- *Develop and implement an interagency comprehensive groundwater protection strategy including GMA critical areas, groundwater management areas, and wellhead protection.*
- *Adopt wastewater reuse and greywater standards to assure public health protection through appropriate treatment, distribution, and reuse of municipal wastewater and household sewage.*
- *Improve the coordination between participating state and tribal agencies.*
- *Create community-based management systems to assure reliable operation and maintenance.*
- *Develop and maintain an integrated water resource database accessible to state and local users.*
- *Ensure that all databases can be/are integrated into the overall Department of Health health information system.*
- *Develop model management strategies for on-site sewage systems and implement them first within designated areas of special concern.*
- *Develop the capacity to identify on-site sewage systems that are not providing adequate treatment.*
- *Develop and implement a model training and certification program directed first to on-site system operation and maintenance personnel.*

Source protection standards

(Outcome standards are for the year 2000 unless otherwise noted.)

Variable	Baseline	Outcome Standards
Groundwater Source Protection	<5% of Group A WSPs using ground water have delineated and inventoried wellhead protection areas (1993).	All Group A PWS using ground water have delineated and inventoried wellhead protection areas.
Surface Water Source Protection	<10% of Group A PWS using surface water sources have a watershed control program (Est. 1994, 179 PWS)	All Group A PWS using surface water as a source of supply have watershed control programs.
Critical Aquifer Recharge Areas	77% of counties have identified critical aquifer recharge areas. (1993)	By 1997, 100% of the states critical aquifer recharge areas identified and protected.

Hazardoussubstances

Hazardous substances are a threat to human health when an exposure occurs at a dose sufficient to cause either acute or chronic health effects. The release of these substances into the environment can lead to the contamination of water, air, soil, and food. These substances and their by-products may persist and accumulate in the environment, the food chain, and the human body.

The exposure of an individual or a community is examined in terms of the total exposure. All possible routes of exposure must be considered to determine the actual dose of the hazardous substance to which the body is exposed. In order to eliminate or control exposure, all pathways, including air, water, food and, soil, must be addressed.

There are currently some 1259 hazardous waste sites identified in Washington State. Of these, 409 have confirmed groundwater contamination problems, and an additional 601 have potential ground water problems.

The federal Agency for Toxic Substances and Disease Registry (ATSDR) has identified seven health conditions that appear consistently with chronic or long-term human exposure to hazardous substances located around hazardous waste sites. These seven health indicators are birth defects and reproductive disorders, cancers, immune function disorders, kidney dysfunction, liver dysfunction, lung and respiratory disease, and neurotoxic and behavioral disorders.

Factors leading to problems associated with hazardous substances include:

- *Steadily increasing releases of hazardous substances into the environment, both in terms of number and total volume.*
- *Inadequate resources to examine the new and emerging issues in the epidemiology and the toxicology of hazardous substances.*
- *Poorly documented etiology linking hazardous substance exposures to disease, i.e., the science relating specific substances to a specific disease.*
- *Lack of a statewide database or surveillance system to compile epidemiologic and environmental data necessary to identify and assess health conditions.*
- *Insufficient epidemiologic data on health conditions which may be caused or exacerbated by hazardous substances (e.g., respiratory conditions, neurotoxic and behavioral disorders, birth defects).*
- *Lack of assurance of environmental equity to those special populations at greater risk of overexposure due to their cultural traditions or socioeconomic constraints.*
- *Lack of knowledge and understanding by the public and health professionals regarding health effects and "safe levels" of exposures to hazardous substances.*
- *Degradation of ambient and indoor air quality as the result of emissions from industrial and nonindustrial sources (i.e., wood stoves, fugitive dusts, natural disasters, motor vehicles).*
- *Minimal coordination between the various state and federal agencies with vested interest in the various components of the environment to develop and promulgate standards.*

Intervention strategies for hazardous substances include:

- *Establish a forum to bring together state agencies (e.g., Departments of Health, Ecology, Labor & Industries, and Transportation) and the appropriate federal agencies to explore the feasibility of coordinating efforts in developing environmental standards.*
- *Promote the improvement of environmental health education in the schools, colleges, and universities in Washington State.*
- *Develop a program to educate the public, health professionals, and health care providers on health risks associated with hazardous substances.*
- *Establish a mechanism to facilitate the flow and exchange of information regarding health risks to the public during crisis periods, such as hazardous waste spills, disease cluster investigations, natural disasters, or other issues of special concern.*
- *Establish a statewide surveillance system to track sentinel health events, health trends, and the overall health status of communities at risk of exposure to hazardous substances.*
- *Identify those factors which place subpopulations of a community at a higher risk of adverse health outcomes from environmental exposures such as fish consumption or residential lead exposure.*
- *Provide adequate support and funding to state and local air pollution authorities and local health agencies to develop air quality reporting, monitoring, and health advisory systems.*
- *Link ambient air quality monitoring with respiratory related hospital/clinic admissions to better understand the association between air quality and respiratory illness.*
- *Strengthen vehicle emission testing and promote car pooling and mass transit systems to reduce emissions of hazardous substances.*
- *Educate the public about indoor air quality, including prevention, abatement, and control of specific problem sources such as wood stoves and naturally occurring radioactivity.*
- *Provide ongoing, joint training of environmental health practitioners and health care providers to bridge the gap between the science of human exposure to hazardous substances and treatment of the individual.*
- *Provide adequate support and funding to state and local public health jurisdictions to assess the impact of hazardous substances on the overall health of the community.*
- *Promote scientific research into the health effects of exposures to hazardous substances, and develop methods to improve environmental risk estimates.*

Hazardous substance standards

Outcome standards are for the year 2000 unless otherwise noted.

Variable	Baseline	Outcome Standards
Environmental Health Education: Elementary and Secondary Schools	Elementary-level environmental health education program is presented in 1% of the schools in Washington state. (1993)	Elementary-level environmental education program presented in 5% of the schools in Washington state.
Hazardous Substances Health Education: Collegiate Level	One environmental health seminar was sponsored and conducted at three of the state's institutes of higher learning.	Ten environmental health seminars conducted at the various state's institutions of higher learning.
Surveillance and Data Needs: Evaluate the relationship between illness and exposure to hazardous substances.	Identified, assessed and are tracking two health conditions possibly associated with environmental exposure from hazardous substances. (1993)	Identify, assess and track all seven priority health conditions found associated with communities located near State hazardous waste sites.
Indoor Air Quality	370 complaints/year (Department of Health-1993)	300 complaints per year.
Pesticide Exposure Incidents	500 pesticide exposure incidents per year. (1993)	No more than 400 pesticide exposure incidents per year.
Toxic Wastes Released by Licensed Activities Into Air	Forty percent of state residents are breathing air meeting EPA National Ambient Air Quality Standards. (1992)	Sixty percent of the state's residents breathe air meeting EPA National Ambient Air Quality Standards.
Environmental Equity	Two research studies are underway which target the unique exposures of special population to environmental agents (i.e. residential lead; shellfish consumption).	Conduct five research studies where special populations are exposed to hazardous substances because of their cultural and/or social/economic status.
Hazardous Substance Health Education: Health Care Providers and Other Professionals	Conducted one workshop in 1994 for health professionals	Conduct four workshops, or short courses per year for health professionals and health care providers.
Disease/Illness Cluster Investigation	50% disease/illness clusters that were perceived as environmental in origin were investigated within the past twelve months. (1993)	Investigate 100% of the disease/illness clusters reported to be related to exposure to hazardous substances.
Environmental Health Education for Communities Affected by Exposure to Hazardous Substances	Four "fact sheets" addressing health concerns and health effects from exposures were developed and distributed. (1993)	Develop and distribute ten "fact sheets" about health concerns and health effects from hazardous substance exposures.

Occupational hazard exposure

The public is increasingly concerned about occupational risks, and public health officials have few reliable surveillance systems and data bases to help them assess such risks. There is a need to identify work related injuries and diseases having significant impact, and to improve surveillance and intervention as soon as possible. For example, there is no reliable count of children and adolescents in the workplace, since there is currently no requirement for a prospective child employee to obtain a personal work permit; similarly, there is no method to identify work status (i.e., full- or part-time) for working children, since there are no records of number of hours worked reported to Employment Security by age of worker. It is thus not possible to calculate child injury or illness rates in a manner comparable to adults.

The roles of state and county public health agencies in occupationally related problems are not well defined. Currently there is strict allocation of responsibility to the Department of Labor and Industries (L&I). However, this fails to recognize the role of health agencies in surveillance, health education, outbreak investigation and assurance of timely and effective delivery of services. For example, workers frequently contact health agencies for information first, sometimes fearing employer reprisals if the contact results in investigation by L&I. Certain occupational problems result in overlapping responsibilities with the Department of Health; examples include the child who is exposed to lead dust brought home on work clothes, and residents exposed in their homes by pesticide drift from agricultural applications.

Occupational issues are complex, require decision-making under conditions of uncertainty, and impact the health and finances of the individual and the community. Addressing the public under these circumstances requires considerable expertise, and errors in communicating risk may unnecessarily heighten concern. Few public officials have had training in "risk communication."

Specific areas of concern include:

Fatal occupational injury: There are roughly 100 traumatic occupational fatalities every year in our state. Death on the job is tragic, but it is not inevitable, even in the high risk occupations and industries. The workplace is the most controlled environment possible in our open society, and while we may not be able to prevent all work-related injuries, we should prevent all fatal occupational injuries. Work in farming, forestry, fishing, and construction is particularly hazardous, though death involving a motor vehicle is the most common traumatic occupational fatality. While our state fatal occupational injury rate is comparable to the national rate, certain populations are at high risk, geographically and by industry type.

Worker injury and illness: Non-fatal occupational injuries and illnesses result in significant worker morbidity, time away from work, and disability. There are over 200,000 claims each year to Workers Compensation in our state for injuries alone. Such injuries adversely effect the personal lives of workers, as well as having significant societal costs in terms of lost productivity, permanent disability, and need for job retraining. Injuries to adolescents pose a special problem, especially in retail trade businesses such as restaurants and food stores, which employ higher proportions of adolescents than do other businesses.

Cumulative trauma disorders: Cumulative Trauma Disorders (CTDs) result from repetitive motion or pressure to joints, tendons and ligaments. There has been a trend of markedly increasing rates, nationally and in our state, over the past decade. CTD results in significant morbidity, lost productivity, and may require permanent job changes, many

times to lower paying jobs. Cumulative trauma disorders may be prevented by applying principles of ergonomics to job design, providing tools which allow joints to be in their anatomically neutral positions during motion, using equipment which dampens vibration, and avoiding activities which involve a great deal of repetition, force, or awkward postures.

Skin disorders: Skin disorders are among the most frequently reported occupational diseases, accounting in 1987 for 28% of all occupational illnesses. These illnesses are distressing to workers, result in lost productivity, can be permanently disabling, and may result in job dislocation because of skin sensitivity. Preventive measures such as chemical substitution, engineering controls, personal protective equipment, and worker education can be effective in reducing the incidence of occupational skin disorders.

Lead: Exposure to lead can produce a variety of adverse cardiovascular, reproductive, neurologic, and blood-related effects. The initial symptoms can be insidious and may result in irreversible disability or death. Workers, their children, and developing fetuses can be affected. Intervention strategies have been shown to be effective. The U.S. Public Health Service has set a goal of eliminating occupational exposures which result in blood lead concentrations greater than 25 mcg/dL by the year 2000.

The reduction of exposure to lead and other hazards depends first on obtaining adequate information about the problem, and then educating employers and employees on ways to control the exposure.

Local public health jurisdictions have a role to play in the prevention of occupational disease and injury, but to do this effectively, a statewide policy needs to be developed. L&I and the Department of Health need to enter into a formal memorandum of understanding that defines the role of health agencies in occupational health issues. The result can be an occupational health program including a defined role for state and local health agencies in collaboration with L&I. This program can include surveillance of general and specific health outcome indicators, knowledge of general occupational health and safety issues, outbreak investigations, and assurance of timely and effective delivery of public health functions.

Intervention strategies to reduce occupational exposure include:

- Identify high risk areas (including industries, occupations, and demographic groups) and target them for education, technical assistance, and hazard surveillance.
- Use workers compensation claim data to identify counties, and specific employers, with high injury and illness rates.
- Use Bureau of Labor Statistics data (Census of Fatal Occupational Injuries, Occupational Injury and Illness Survey) to identify racial/ethnic groups with high injury and illness rates.
- Develop a system to track progress toward the outcome objectives.
- Identify work-related injuries/diseases for which insufficient incidence/prevalence data exist, but where the potential and severity of resulting worker disability mandates the development of surveillance and intervention activities. (An example is occupational lung disease.)
- Investigate all fatal occupational injuries.
- Refine the method of counting occupational skin disorders, using the results from the NIOSH-funded Sentinel Event Notification System for Occupational Risk (SENSOR) surveillance project.

- *Determine the source of lead exposure for all individuals with lead concentrations over 25 mcg/dL.*
- *Increase the number of lead-using employers who offer biological monitoring to lead-exposed employees.*
- *Recognize and define the role of local public health jurisdictions in prevention of occupational injury and disease. L&I and the Department of Health should plan to enter into a formal memorandum of understanding that defines the role of health agencies in occupational health issues.*
- *Develop economic incentives, such as industrial insurance pricing structures, to motivate employers to comply with prevention guidelines aimed at reducing exposure to occupational hazards.*
- *Periodically review existing child labor regulations, to revise prohibited duties based on research findings and knowledge about adolescent developmental capabilities.*
- *Plan the Washington State implementation of the federal School-to-Work Opportunities Act of 1994 to include health and safety training modules in the curricula.*
- *Develop relevant safety and security standards to protect employees at high risk of fatal injury.*
- *Develop prevention measures for respiratory illnesses, such as tuberculosis, for at-risk occupational groups.*
- *Provide effective risk communication training.*
- *Communicate effectively with the news media.*
- *Promote age-appropriate education and training programs on workplace health and safety issues to employers and schools, including hazard communication, injury prevention, use of personal protective equipment, and safe task performance and tool-handling.*
- *Educate employers and employees regarding likely sources of occupational injury risks (chemical, physical, mechanical, or vector).*
- *Provide periodic driver education with emphasis on seat belt usage.*
- *Provide employer and worker education to prevent CTDs.*
- *Educate employers and employees regarding likely sources of skin disorders (chemical, physical, mechanical, or vector).*
- *Provide information and technical assistance regarding risk reduction of lead exposure in the home and the workplace.*
- *Promote employee/employer education on risks associated with drug, alcohol and tobacco use in the workplace.*
- *Decrease exposure through chemical or process substitutes, engineering controls, personal protective equipment, and work practices.*
- *Use worksite inspections and enforcement of regulations where necessary to reduce current occupational hazards and deter future hazards.*
- *Promulgate relevant safety and security standards to protect employees at high risk of fatal injury.*
- *Apply principles of ergonomics in job design to prevent CTDs.*
- *Increase the proportion of primary care providers who routinely elicit occupational health exposures as a part of patient history and provide relevant counseling.*
- *Coordinate interagency efforts relating to occupational health.*
- *Design planned public health databases (including the Health Services Information System), and redesign existing public health databases, to incorporate occupational data fields including occupation, industry, and employer.*
- *Make certain occupational conditions “reportable” under a public health system separate from workers compensation.*
- *Ensure that all databases can be/are integrated into the overall Department of Health information system.*

Occupational hazard exposure: Outcome standards

Fatal Occupational Injuries (rate per 100,000)

Census of fatal occupational injuries data

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Baseline		Year 2000 Target Rate
		Count	Rate		Year(s)	Rate	
All Industries	1993	108	4.5	3.7	1987	6.0	4.0
Construction	1991-93	11	9.9	8.0	1987	25.0	17.0
Transportation	1991-93	17	1.4	11.0	1987	15.2	10.0
Agriculture	1991-93	6	9.6	7.5	1987	14.0	9.5
Logging	1991-93	5	58.3	2.9		NA	NA

*Technical notes: Washington data are from L&I/ BLS Census of Fatal Occupational Injuries (CFOI); US data from Bureau of Labor Statistics Annual Survey. Rates are calculated per 100,000 full-time equivalent (FTE) workers: self-employed and active duty military are included only in the "all industry" rate. Counts and rates for 1991-93 are annualized.

Non-fatal occupational injuries (rate per 100)

Bureau of Labor Statistics Annual Survey

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Baseline		Year 2000 Target Rate
		Count	Rate		Year(s)	Rate	
All Industries	1992	149,100	10.8	9	1987	7.7	6
Construction	1992	19,400	21.3	17	1987	14.9	10
Health Care	1992	6,100	23.9	19	1987	12.7	9
Agriculture	1992	4,700	12.7	10	1987	12.4	8
Transportation	1992	12,100	12.9	10	1987	8.3	6
Logging	1992	2,100	29.9	22		NA	NA

*Technical notes: Data are from Bureau of Labor Statistics Annual Survey of private sector employers. Counts are estimates based on survey sampling. Rates are calculated per 100 full-time equivalent (FTE) workers.

Workers compensation data

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
All Industries, All Claims	1993	161,926	13.4	12.0		NA	NA
Construction	1993	28,380	30.2	24.0		NA	NA
Health Care	1993	8,280	11.2	10.0		NA	NA
Agriculture	1993	8,901	16.7	13.0		NA	NA
Transportation	1993	7,015	17.1	14.0		NA	NA
Logging	1993	1,582	41.8	33.0		NA	NA
All Industries, Time Loss Claims	1993	32,973	2.7	2.4		NA	NA
Construction	1993	6,655	7.1	5.8		NA	NA
Health Care	1993	1,974	2.7	2.4		NA	NA
Agriculture	1993	1,954	3.6	2.9		NA	NA
Transportation	1993	2,088	5.1	4.3		NA	NA
Logging	1993	573	15.1	12		NA	NA

*Technical notes: Data are from L&I Workers' Compensation program, State Fund employers only. Time loss is defined as more than three days; claims include only those for which medical benefit were paid. Rates are calculated per 100 full-time equivalent (FTE) workers. NA = not available.

Occupational injuries to adolescents aged 16-17 (rate per 100)

L&I workers compensation data

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
All Industries	1990	4,031	9.0	5		NA	NA
Construction	1990	159	21.1	10		NA	NA
Agriculture	1990	170	11.4	6		NA	NA
Restaurants	1990	1,640	11.0	6		NA	NA

*Technical notes: Data are from L&I Workers' Compensation program, State Fund and self-insured employers. Rates are calculated per 100 workers, full and part-time; denominators are from 1990 US Census data, not comparable Workers Compensation data.

All cumulative trauma disorders (rate per 100,000)

Bureau of labor statistics annual survey

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
All Industries	1992	8,206	594	440	1987	100	60
Manufacturing	1992	5,866	1831	1180	1987	355	150
Meat Products	1992	302	7446	5200	1987	3920	2000
Construction	1992	198	217	180		NA	NA

*Technical notes: Data are from Bureau of Labor Statistics Annual Survey of private sector employers. Cases are defined as "cumulative trauma disorder," which includes carpal tunnel syndrome and other disorders due to repeated injury such as bursitis, Raynaud's, and noise-induced hearing loss. Counts are estimates, based on survey sampling. Rates are calculated per 100,000 full-time equivalent (FTE) workers.

Cumulative trauma disorders (rate per 100,000)

L&I workers compensation data: Carpal tunnel syndrome

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
All Industries	1993	1,890	157	120		NA	NA
Manufacturing	1993					NA	NA
Meat Products	1993					NA	NA
Construction	1993	253	269	200		NA	NA

*Technical notes: Data are from L&I Workers' Compensation program, State Fund employers only. Cases are defined as claims for Carpal Tunnel Syndrome. Rates are calculated per 100,000 full-time equivalent (FTE) workers.

Occupational skin disorders (rate per 100,000)

Bureau of labor statistics annual survey

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
All Industries	1992	1,377	100	90	1987	64	55
Agriculture	1992	122	224	190		NA	NA

*Technical notes: Data are from Bureau of Labor Statistics Annual Survey of private sector employers. Counts are estimates, based on survey sampling. Rates are calculated per 100,000 full-time equivalent (FTE) workers.

Occupational skin disorders (rate per 100,000)

L&I workers compensation data

Washington State					United States		
	Year(s)	Baseline	Rate	Year 2000 Target	Year(s)	Baseline	Year 2000 Target
		Count		Rate		Rate	Rate
All Claims, All Industries	1993	1,044	87	80		NA	NA
Agriculture	1993	114	214	184		NA	NA

*Technical notes: Data are from L&I Workers' Compensation program, State Fund employers only includes all claims for which medical benefits were paid. Rates are calculated per 100,000 full-time equivalent (FTE) workers.

Occupational lead exposure

L&I blood lead concentrations data

Washington State				United States		
	Year(s)	Baseline	Year 2000 Target	Year(s)	Baseline	Year 2000 Target
		Count	Count		Count	Count
Lead Registry Data	1994	324	0	1992	7842	0

*Technical notes: Data are from L&I Workers' Compensation program, State Fund employers only includes all claims for which medical benefits were paid. Rates are calculated per 100,000 full-time equivalent (FTE) workers.

Foodprotection

Foodborne organisms and contaminants cause serious illnesses among residents of our state. The causes may be bacteria, viruses, parasites, or chemical contamination of foods. It is estimated that Washington experiences 250,000 cases of foodborne disease annually. A conservative estimate of the cost of these diseases is \$160,000,000. These figures do not include recent outbreaks of E.coli O157:H7. If these are included the total cost to the State of Washington would be significantly higher.

Foodborne illnesses can spread rapidly throughout the general population. Examples include the emergence of E.coli O157:H7, which can spread rapidly through food distribution channels, and intermittent exposures of the dining public to food handled by workers who transmit the Hepatitis A virus. These threats are particularly serious among susceptible groups such as infants, young children, the elderly, and people with compromised immunity. They also demonstrate the devastating consequences of foodborne disease, not only for people who get ill and their families, but also for those who work in the food service industry.

Because of the diverse cultural population of the state and improvements in transportation, there are a wide variety of foods available to the people of Washington. Many foods are prepared and eaten at home, but often foods are prepared by retail food establishments and eaten either at home or at or near the point of purchase. Typical food establishments of concern from an environmental health perspective include restaurants, grocery stores, delicatessens, mobile units, food booths at fairs and festivals, and institutions such as schools, hospitals, jails, day care facilities, and nursing homes. Some segments of the population are exposed to additional risk through the collection and consumption of wild plants and animals and the use of herbs and spices that are occasionally contaminated. Another significant area of food safety concern is the occurrence of botulism in foods that are prepared in the home. While there are only a few cases of Botulism poisoning every year, the personal and economic costs are frequently very high.

Prevention is the most critical element of protection against foodborne disease. Prevention requires intervention at many levels, including consumer education, food worker training, epidemiology, emergency response, and changes in agricultural and food industry practices. Since foods are often transported great distances from the farm through one or more processors and distribution centers before reaching the consumer, it is essential that contamination and adulteration be controlled at every step. If contamination is not controlled, foodborne disease often results. Also, potential hazards change as methods of food preparation and production change. Therefore, intervention strategies must be reviewed continually to assure they remain adequate. The role of environmental health practitioners in prevention is to educate the public and food workers and monitor the distribution system.

The prevention of illness is substantially less costly than treatment and curative measures. It is particularly desirable to practice prevention within the food handling process in order to avoid or minimize human suffering, lost productivity, costs of medical treatment, and litigation.

Factors which contribute to the spread of foodborne disease include:

- Improper temperature control by commercial and domestic food handlers during cooking, cooling, hot holding, and reheating of potentially hazardous foods.*
- Lack of knowledge about proper food handling by food handlers in homes and food service establishments.*
- Contamination of foods of animal origin with foodborne pathogens such as Salmonella spp, Campylobacter jejuni, and Vibrio parahaemolyticus.*
- New or emerging pathogens which pose a threat to food safety.*
- Inconsistent surveillance and enforcement of minimum food protection standard between communities.*
- Processing of foods at the retail and wholesale levels without adequate regulatory oversight.*
- Incomplete diagnosis, reporting and investigation of cases and outbreaks of foodborne disease.*
- The high turnover rate among retail food workers and managers. (The federal Food and Drug Administration estimates 400% turnover per year among retail food workers and 100% among food service managers.)*

Intervention strategies to prevent foodborne disease include:

- *Provide regular, continuous, and widespread education to the general public concerning foodborne disease prevention and control.*
- *Provide more comprehensive education to food industry personnel about general and specific food handling and safety measures, including material tailored to the needs of those not fluent in English, the functionally illiterate, and the physically or mentally challenged.*
- *Educate infected food handlers and day care providers about specific actions they can take to avoid spreading disease to others, including food handling and contamination prevention techniques.*
- *Provide adequate numbers of well-trained health professionals and other resources necessary to prevent the introduction and spread of foodborne disease.*
- *Enhance local capacity to ensure epidemiologic investigations of all foodborne disease outbreaks.*
- *Develop food programs to address all new emerging diseases by initiating surveillance and education of food workers with targeted interventions directed at the food service industry.*
- *Standardize food safety regulations used throughout the state by federal, state and, local jurisdictions.*
- *Provide surveillance which is consistent and responsive at levels commensurate with the risk of spread of foodborne disease.*
- *Increase use of the hazard analysis, critical control points (HACCP) system to address foodborne disease hazards in a preventive manner.*
- *Strictly enforce food handling safety regulations at all levels of inspections, with predictable outcomes and consistency between communities.*
- *Develop field monitoring technologies to detect conditions which foster contamination of food.*
- *Encourage cooperation among food protection agencies to avoid gaps and overlaps in their activities.*
- *Develop programs and requirements for certification of all managers of food service establishments serving a complex menu or using complex food preparation methods.*
- *Encourage health care providers to culture patients when foodborne disease is suspected.*
- *Provide for prompt notification of the Department of Health and local health agencies in the event of a suspected disease outbreak.*
- *Develop computer networks for sharing local and national developments regarding food safety.*

Food protection standards

Washington State					United States		
	Year(s)	Baseline		Year 2000 Target Rate	Year(s)	Baseline	
		Count	Rate			Rate	Year 2000 Target Rate
Foodborne disease cases*	1988-1992	705	14.1	10.2			
Salmonella spp cases**	1988-1992	656	13.1	8.9	1987	18	16
Campylobacter jejuni cases**	1988-1992	900	18.0	15.5	1987	50	25
E. coli 0157:H7 cases**	1988-1992	202	4.0	4.4	1987	8	4
Clostridium perfringens cases*	1988-1992	213	4.3	3.7			

Rates are reported cases per 100,000 population.

*Foodborne disease cases, including clostridium perfringens, are from outbreak reports. Single cases are not counted except for botulism and "chemical" etiologies.

**Enteric disease reporting includes single cases of campylobacter, E. coli 0157:H7, and salmonella spp. It is estimated that 90% of these diseases are foodborne.

Variable	Baseline	Outcome Standards
Risk factors related to the manufacture, processing and service of food	45% retail food establishment inspections result in scores with more than 35 critical violation points. (1993)	No more than 25% of food service establishment inspections result in scores with more than 35 critical violation points. (APEX-EH)

Shellfish growing areas

Washington State is one of the major producers of molluscan shellfish (oysters, clams, and mussels) in the U.S. In addition, nearly half a million people harvest shellfish recreationally from Washington tidelands.

Organisms such as Hepatitis A virus, other enteric viruses, naturally occurring marine pathogens, and pollution-related pathogens have been identified in Washington State shellfish grown in contaminated waters. Natural biotoxins, such as paralytic shellfish poison (PSP) and domoic acid, are also found frequently in Washington's shellfish. These biotoxins produce both temporary and permanent neurological symptoms, and are potentially fatal. In 1991 over 20 cases of domoic acid poisoning were related to consumption of razor clams from the Washington Coast. A history of PSP toxins in shellfish has created periodic episodes involving varying degrees of severity of illness in consumers.

In the last 15 years, a substantial portion of Puget Sound's shellfish growing areas have been closed to harvest due to inadequate control of point and non-point water pollution sources. Closures limit the public's opportunity to harvest and consume shellfish, and cost the shellfish industry millions of dollars each year. If water quality standards are met for shellfish harvesting, water quality is satisfactory for all water recreation, including swimming, diving, and other water contact activities.

Factors leading to shellfish growing area closures or disease outbreaks include:

- *Insufficient governmental resources to identify and correct non-point pollution sources such as on-site sewage systems, farm animal waste, and waste from boats and marinas.*
- *Insufficient education of recreational shellfish harvesters, especially limited English speaking immigrants.*
- *Inadequate resources to upgrade sewage treatment plants.*
- *Insufficient patrolling of closed areas to prevent contaminated shellfish from reaching markets.*
- *Insufficient monitoring of public recreational shellfish beaches.*
- *Insufficient education of near shore property owners on effects of land use activities.*
- *Insufficient support to promote increased enforcement of non-point water pollution regulations.*
- *Insufficient control of shoreline and watershed development resulting in water quality degradation.*

Intervention strategies for shellfish protection include:

- *Regularly monitor shellfish growing areas, including commercial areas and public beaches.*
- *Periodically evaluate local non-point pollution control programs.*
- *Conduct epidemiological investigations of foodborne illnesses associated with shellfish.*
- *Establish an educational program about safe shellfish harvesting and consuming practices, including the risks associated with eating raw shellfish.*
- *Expand the cultural outreach education targeting high shellfish consuming populations.*
- *Expand education about proper cooking of shellfish during the summer when the risk of *Vibrio parahaemolyticus* infections is highest.*
- *Regularly patrol areas closed to harvest.*
- *Locate and correct non-point pollution sources.*
- *Provide state technical assistance to local governments.*
- *Provide ongoing evaluation of point and non-point pollution control methods.*
- *Close implicated shellfish growing areas when there is a confirmed outbreak associated with shellfish.*
- *Assure the capacity for laboratory analysis capable of identifying levels of biotoxin and bacteriological parameters to assure safe shellfish.*
- *Adopt and implement development standards appropriate to critical shoreline conditions.*
- *Close shellfish areas failing to meet water quality standards.*
- *Provide surveillance of imported shellfish products to assure compliance with applicable standards.*
- *Increase use of the hazard analysis, critical control points (HACCP) systems in shellfish facilities to prevent shellfish borne disease.*
- *Routinely monitor commercial shellfish plants to assure compliance with sanitation standards.*

Shellfish growing areas: Water quality standards

(Outcome standards are for the year 2000 unless otherwise noted.)

Variable	Baseline	Outcome Standards
Biotoxin Illnesses	From 1990-1993, 20 cases of biotoxin poisoning	Prevent biotoxin diseases yet allow harvest areas to remain open when biotoxins are not a threat.
Pollution Related Illnesses	From 1990-1993, two pollution related illness outbreaks resulting in approx. 60 cases. Causative agents not confirmed.	No more than one pollution related illness outbreak in any three year period.
Illnesses Related to Naturally Occurring Marine microbes	From 1990-1993 approximately 20 cases/year of <i>Vibrio parahaemolyticus</i>	Implement strategies to reduce cases of <i>V. parahaemolyticus</i> by 15% of baseline.
Water Quality in Shellfish Growing Areas	From 1980-1993 shellfish harvesting was restricted or prohibited in 20 areas due to water quality problems. Five of those areas had some of the restrictions lifted.	Establish community-based efforts to prevent shellfish growing area closures. Lift restrictions on one area per year.
Shellfish processing plant sanitation	5% of shellfish processing facilities have approved have approved HACCP plans (1994).	Increase percentage of shellfish processing plants with approved HACCP plans to 50%.
Classification of public shellfish beaches	50% of priority public shellfish beaches classified (1994).	90% of priority public shellfish beaches classified.

Recreational water

Natural bathing water have accounted for sporadic outbreaks infecting up to several hundred people in a single episode. *Pseudomonas* skin infections associated with use of spa facilities have continued to be an ongoing problem in both commercial and private facilities. Injuries and deaths are a major source of concern in relation to recreational waters. These are addressed in detail in the section of this report that deals specifically with Injury and Violence.

Factors leading to the need for recreational water protection include:

- Unsanitary conditions created by large numbers of bathers in natural bathing waters with poor dilution and mixing patterns.
- Contamination of natural waters from point and non-point sources.
- Inadequate maintenance and treatment of pools and spas.
- The number of drowning and near-drowning incidences and injuries occurring annually in Washington's recreational waters.

Intervention strategies for recreational water include:

- *Develop regulations or standards for bathing beaches to address water quality and safety.*
- *Improve training opportunities for regulatory agencies and facility operators.*
- *Develop a monitoring and reporting network.*
- *Evaluate local health programs.*
- *Educate and inform the public regarding the occurrence and prevention of waterborne diseases, such as swimmer's itch.*

Water quality standards: Recreational water

(Outcome standards are for the Year 2000 unless otherwise noted.)

Variable	Baseline	Outcome Standards
Pseudomonas	20 cases per year (1993)	No more than five cases per year.
Enteric (Gastrointestinal)	One outbreak - 100 cases (1993)	No more than one outbreak in any five year period.

Performance measures for the Department of Health: 1995-97 biennial budget

Goals:

1. *Improve the general health status of the population.*
2. *Reduce infectious disease.*
3. *Reduce noninfectious disease.*
4. *Reduce violence and injury.*
5. *Improve family and individual health.*
6. *Reduce environmental threats to health.*
7. *Improve and assure the quality of health care delivery systems.*

Objectives:

General health status:

1. *Reduce the age-adjusted total death rate from all causes to 400/100,000.*
2. *Increase average life expectancy at birth to 80 years.*
3. *Reduce the percentage of the population ages 18 and over reporting only fair or poor health to 8%.*
4. *Increase the average number of reported "good health days" to 27.*

Infectious disease:

1. *Confine AIDS incidence to a rate not exceeding 15.4/100,000.*
2. *Reduce the tuberculosis incidence rate to 2.0/100,000.*

3. *Increase the percentage of children aged 0-23 months who are appropriately immunized to 90%.*
4. *Increase the percentage of school-aged children who are appropriately immunized to 96%*
5. *Reduce the rate of primary and secondary syphilis incidence to 1.0/100,000.*
6. *Reduce the rate of gonorrhea incidence to 60/100,000.*
7. *Reduce the rate of chlamydia incidence to 170/100,000.*

Non-infectious disease:

1. *Reduce the age-adjusted coronary heart disease death rate to 74/100,000.*
2. *Reduce the age-adjusted stroke death rate to 19/100,000.*
3. *Reduce the age-adjusted overall cancer death rate to 120/100,000.*
4. *Slow the rise in lung cancer deaths to achieve an age-adjusted rate of no more than 40/100,000.*
5. *Reduce the percentage of persons age 18 and older who currently smoke cigarettes to 15%.*
6. *Reduce the age-adjusted female breast cancer death rate to 18.9/100,000.*
7. *Increase the percentage of women ages 50 and older who have received a mammogram in the last two years to 80%.*
8. *Reduce the age-adjusted cervical cancer death rate to 1.6/100,000 women.*
9. *Increase the percentage of women ages 18 and older who have had a Pap test in the last two years to 90%.*
10. *Increase the percentage of persons ages 18 and older who have ever had their cholesterol checked to 75%.*
11. *Increase the percentage of persons ages 18 and older who have had their blood pressure checked in the last 2 years to 99%.*

Violence and injury:

1. *Maintain the age-adjusted homicide death rate at 5.4/100,000.*
2. *Reduce the rate of youth aged 10-17 arrested for violent crimes to 4.2/1,000.*
3. *Reduce suicide death rate for youth aged 15-19 to 11.2/100,000.*
4. *Reduce the age-adjusted motor vehicle death rate to 12.8/100,000.*
5. *Increase the percentage of drivers who use seat belts to 85%.*
6. *Reduce the age-adjusted fall-related death rate to 3.0/100,000.*
7. *Reduce the age-adjusted drowning death rate to 2.0/100,000.*

Family and individual health:

1. *Reduce infant mortality to 6.5/1,000 live births.*
2. *Increase the percentage of pregnant women who receive prenatal care in the first trimester to 90%.*
3. *Reduce the incidence of low birth weight to 4.2% of live births.*
4. *Reduce pregnancies among girls age 15-17 to 45/1000.*
5. *Reduce the percentage of women giving birth who smoke cigarettes during pregnancy to 10%.*
6. *Reduce the percentage of women giving birth who use alcohol during pregnancy to 6%.*
7. *Reduce regular use of cigarettes in grade 12 to 21.2%.*
8. *Reduce the percentage of people aged 18 and older who are overweight to 20%.*

Environmental health:

1. *Reduce the rate of foodborne illness cases to 10.2/100,000.*
2. *Investigate 100% of disease/illness clusters reported to be related to exposure to hazardous substances.*
3. *Increase the percentage of Group A public water systems which comply with operating permit requirements to 95%.*
4. *Increase the percentage of large on-site wastewater systems which comply with operating permit requirements to 95%.*
5. *Reduce the rate of noncompliance at x-ray facilities to 200/1,000 facilities inspected.*
6. *Reduce the number of recreational water-related pseudomonas skin infection cases to no more than five per year.*

Health systems quality assurance

1. *Conduct required inspections of 100% of licensed health care sites that require on-site inspections in the time frames prescribed by rule or law.*
2. *Monitor proficiency testing performance for 100% of medical test sites that must participate in a proficiency testing program.*
3. *Investigate 100% of valid complaints brought against health care facilities or professionals within the time frames prescribed by rule or law.*
4. *Reduce Emergency Medical Service response times for trauma calls by 5%.*
5. *Decrease the number of health care providers providing substandard health care by 10%.*
6. *Reduce the number of health care providers prohibited from the practice of their profession by 10%.*